

the height or antero-posterior diameter of the second premolar; in *H. bicolor* the anterior has nearly as great a horizontal diameter as the posterior tooth.

Dimensions of the type:—

Forearm 42·5 millim. (the second specimen 40).

Head and body 47; tail 21; head 17·6; nose-leaf 6·5 × 5; ear 15; third finger, metacarpal 32, first phalanx 13·5, second phalanx 16; lower leg and foot (c. u.) 23·5; calcar 9·5.

Hab. Mount Mulu, Baram District, Sarawak.

Type. Adult female. B.M. no. 94. 9. 29. 10. Collected by Mr. Charles Hose. Two specimens examined.

This species may be readily distinguished from *H. bicolor* by its pointed ears, small anterior lower premolar, and the other characters above described. From *H. sabanus**, which shares its unusually small lower premolar, it is separated by its larger nose-leaf, the unnotched front edge of the horseshoe, and the division of the posterior leaf by vertical ridges.

XLVI.—A Preliminary Report on *Hydromedusæ* from the Falkland Islands. By EDWARD T. BROWNE, Zoological Research Laboratory, University College, London.

MR. RUPERT VALLENTIN visited the Falkland Islands during the summer of 1898–99 for the purpose of investigating the marine fauna, and he brought back a fine collection of Medusæ in an excellent state of preservation. This collection he most kindly placed in my hands without any restrictions.

Up to the time of Mr. Vallentin's visit very little was known about the marine fauna of the Falklands. There had been no thorough investigation, and our knowledge was based partly upon small collections made by exploring-ships like the 'Challenger,' which usually only stayed a few days, and partly upon small collections made by inhabitants and sent to friends in this country.

Our knowledge of the Medusæ was limited to three species:—*Hippocrene Macloviana* (Lesson), *Stomobrachium lenticulare*, Brandt, *Desmonema Gaudichaudi* (Lesson).

Hippocrene Macloviana and *Desmonema Gaudichaudi* were first described by Lesson (Voyage de la 'Coquille,' 1829). The *Hippocrene* is apparently a regular inhabitant of Stanley Harbour. Its hydroid, no doubt, lives there, and probably

* Ann. & Mag. Nat. Hist. (7) i. p. 243 (1898).

belongs to the family Bougainvillidæ. This medusa was also taken by the 'Challenger.' The descriptions and figures are based upon an intermediate stage in its life-history and not upon the fully grown adult, of which there are some fine specimens in this collection.

The *Desmonema*, a Scyphomedusa belonging to the family Cyaneidæ, has only been recorded by Lesson, and his description is rather vague. Mr. Vallentin found a large Scyphomedusa very abundant in Stanley Harbour, but preserved only one small specimen, which is, unfortunately, just too young to determine for certain the genus; it belongs to the Cyaneidæ.

Stomobrachium lenticulare was taken by Mertens in 1827 and described by Brandt (1838). It is a Leptomedusa of the family Æquoridæ, which is not represented in the collection.

Our knowledge of the Falkland Medusæ is now extended to sixteen genera and seventeen species, all, with one exception, taken in Stanley Harbour. The harbour is described in the Admiralty Pilot-Book as a large natural dock about 3 miles long and $\frac{1}{2}$ of a mile broad, with a very narrow entrance about 250 yards across. The bottom is stiff mud and the deepest part is about 4-5 fathoms.

The Hydromedusæ (*Craspedota* of Hæckel) are divided into four orders:—1. Anthomedusæ; 2. Leptomedusæ; 3. Trachomedusæ; 4. Narcomedusæ. The Medusæ of the first two orders I regard as belonging to the littoral fauna, whilst the Trachomedusæ and Narcomedusæ are oceanic. They only occasionally come within the littoral limits, being driven towards shore by strong winds.

The Medusæ in this collection nearly all belong to the two orders Anthomedusæ and Leptomedusæ. There are no Narcomedusæ and only two Trachomedusæ, one of which (*Vallentinia falklandica*) has probably adopted a littoral habitat and lives amongst the kelp-forests which surround the Falkland shores. The other (*Aglauropsis*) is a typical oceanic medusa which had invaded the harbour in shoals.

The scientific value of the collection is enhanced by its being the first good littoral collection made on the shores of the South Atlantic Ocean. It is the result of tow-netting almost daily for three months (7th November, 1898, to 6th February, 1899) in one place. Most of the Medusæ formerly recorded for the South Atlantic are oceanic forms, chiefly the large Scyphomedusæ. There are only eight species of Anthomedusæ and Leptomedusæ previously recorded, most of them from localities scattered (or not stated) along the coast of Brazil.

The zoological interest in the collection is not so much in the number of new species as in the genera and their geographical distribution. There is a marvellous resemblance between the medusoid fauna of Stanley Harbour and the medusoid fauna found in British seas. Out of the sixteen Falkland genera no less than thirteen occur in our seas, and to these genera most of our species (and some of our commonest species) belong.

The three Falkland genera which are not found in our seas are two new genera (*Tiaricodon* and *Vallentinia*) and a rediscovered genus (*Aglauropsis*). The two new genera have interesting characters connected with them.

Tiaricodon shows a connecting-link between the families Codonidæ and Tiaridæ. At its earliest stage it is just like a little *Sarsia* (Codonidæ), but the adult, a fine medusa, has the characteristics of the Tiaridæ.

Vallentinia is a Trachomedusa with the four perradial tentacles modified into suckers, and the other tentacles are of the normal Trachomedusa type. This medusa was found amongst the kelp, and its habits are probably somewhat similar to those of *Cladonema* (Anthomedusæ), which lives amongst our *Zostera*-beds.

Aglauropsis has only recently developed a history. Formerly only one species (*Aglauropsis Agassizii*) was known, and from the coast of Brazil. It was taken and described by Fritz Müller (1865), but the description is so incomplete that only the generic characters are given. There are no figures of the species and no further records. It is quite possible that the Falkland *Aglauropsis* also occurs on the Brazilian coast, as it is a Trachomedusa and belongs to the oceanic forms.

Last autumn I received from my friend Dr. F. W. Gamble some Medusæ from Roscoff, on the French side of the English Channel, and amongst them were some fine specimens of an *Aglauropsis*. It is another species, which I intend soon to describe and figure.

The new genus *Phialella* mentioned in this Report is of no importance; it is only the result of a further splitting-up of the old genus *Thaumantias*.

The large number of specimens which Mr. Vallentin's collection contains has added considerably to our knowledge of the development and the life-history of some of the species. The development of the Falkland species is similar to that of their British allies.

It is only of comparatively recent date that attention has been given to the tracing of the life-history of Medusæ through

the various stages of development, and this neglect in earlier days has led to a number of spurious genera and species being made out of the early and intermediate stages. The different stages of the same species having been arranged in several genera has caused great confusion and has placed classification on an insecure foundation.

Mr. Vallentin is now at the Falklands making further investigations on their marine fauna, and a second collection of Medusæ is likely to arrive during the coming summer. For this reason I have prepared a preliminary Report on the present collection, and will publish a complete Report when the second collection has been examined.

In this preliminary Report the coloration of the species has been omitted. The specimens are in formalin or alcohol, consequently the brightness and brilliancy of the colours are destroyed. Mr. Vallentin has undertaken to note down the colours of the Medusæ found on his present visit, so that the true colours can be given in the next Report.

ANTHOMEDUSÆ.

Codonidæ.

SARSIA, Lesson (1843).

Sarsia gracilis, sp. n.

Umbrella cylindrical, nearly twice as high as broad, with moderately thick walls and a quadrangular margin.

Stomach a cylindrical tube, about two thirds of the length of the umbrella-cavity.

Gonads surround nearly the whole length of the stomach.

Tentacles four, about the same length as the umbrella, terminating with large knob containing nematocysts.

Ocellus on the basal bulb of each tentacle.

Size: up to 5 millim. in height and 3 millim. in width.

About three dozen specimens in the collection, forming a good series of stages extending from the earliest form up to the adult.

AMPHICODON, Hæckel (1879).

Codonidæ with a single tentacle or a single group of two or more tentacles, periradially situated, and three rudimentary periradial basal bulbs without tentacles. Margin of the umbrella not at right angles to the longitudinal axis of the umbrella, but slopes towards the side carrying the tentacle or the group of tentacles.

Amphicodon unicus, sp. n.

Umbrella bell-shaped, a little higher than broad.

Stomach cylindrical and nearly as long as the umbrella-cavity.

Gonads surround the tube-like stomach and extend from near the base of the stomach to close to the mouth.

One solitary tentacle, situated between two rudimentary basal bulbs; three perradial bulbs without tentacles.

Size: 3 millim. in height and 2 millim. in width.

The collection contains only a single specimen.

Tiaridæ.

TIARICODON, gen. nov.

Tiaridæ with four perradial tentacles.

Stomach with four perradial lobes extending along a peduncle.

Gonads upon the stomach and the lobes.

Exumbrella smooth, without nematocysts.

Margin of the umbrella without bulbs between the tentacles.

No perradial mesenteries.

Tiaricodon cæruleus, sp. n.

Umbrella bell-shaped, with a rounded summit, about as high as broad.

Exumbrella smooth and not covered with nematocysts. Velum narrow.

Stomach a quadrangular tube extending down nearly to the velum and situated on a short broad peduncle.

Mouth with four perradial lips, about as wide as the stomach; margin folded.

Gonads surrounding the base of the stomach and extending over the peduncle along the four perradial sac-like lobes.

Tentacles four, perradial, fairly stout, and tapering to a point.

Basal bulbs large, cylindrical, a little longer than broad, with an ocellus.

Size: 25 millim. in height and 24 millim. in width.

The collection contains twelve specimens, showing the early, intermediate, and adult stages. The earliest stage is just like a little *Sarsia*.

TIARA, Lesson (1837).

Tiara intermedia, sp. n.

Umbrella bell-shaped, little broader than high, with a large conical crown.

Stomach broad and massive, with perradial lobes; about half to two thirds the length of the umbrella-cavity.

Mouth large, with four lips, and the margin slightly folded.

Gonads on the sides of the perradial lobes of the stomach and in small horizontal folds.

Tentacles eight (four perradial and four interradial), and eight adradial bulbs without tentacles.

Ocellus on the outer side of every tentacular basal bulb and the adradial bulbs.

Size: up to 7 millim. in height (including the crown) and 5 millim. in width.

Five specimens in the collection belonging to the early and intermediate stages. The full-grown adult stage I believe to be absent.

The Falkland species has much larger ocelli, broader basal bulbs, and a broader umbrella than *Tiara pileata* at the same stages, but the general resemblance is uncommonly close.

Margelidæ.

DYSMORPHOSA, Philippi (1842).

Margelidæ with eight marginal tentacles (four perradial and four interradial). Mouth with clusters of nematocysts or with simple undivided oral tentacles having a terminal cluster of nematocysts.

Dysmorphosa tenuis, sp. n.

Umbrella somewhat conical, with a slight constriction above the subumbrella-cavity; a little higher than broad.

Stomach cubical and on a peduncle about as long as itself.

Mouth with four lips, having terminal clusters of nematocysts.

Medusa-buds upon the stomach, interradially situated. (Gonads not yet developed.)

Tentacles eight.

Size: up to 2 millim. in height and $1\frac{1}{2}$ millim. in width.

The collection contains only two specimens.

LIZZIA, Forbes (1846).

Margelidæ with marginal tentacles arranged in eight groups (four perradial and four interradial). Oral tentacles simple, unbranched, with clusters of nematocysts.

Lizzia formosissima, sp. n.

Umbrella bell-shaped, a little higher than broad, with a slight transverse constriction level with the top of the sub-umbrella-cavity and a solid mass of jelly above it.

Stomach small, somewhat cubical, about as long as broad, and situated on a broad peduncle about as long as the stomach.

Mouth with a plain simple margin, rather quadrangular in shape.

Oral tentacles four, each with seven to eleven clusters of nematocysts, arranged in a double row, with always a single terminal cluster.

Gonads on the stomach, four interradial roundish swellings or masses.

Tentacles five in each perradial group and three in each interradial group.

Size: up to 3 millim. in height and $2\frac{1}{2}$ millim. in width.

The collection contains twelve specimens showing different stages in development.

The early stages have medusa-buds upon the stomach and only three tentacles in each group.

HIPPOCRENE, Mertens (1829).

Margelidæ with four perradial groups of tentacles, each group with two or more tentacles. Four branched oral tentacles, with terminal clusters of nematocysts. Stomach on a peduncle, with perradial lobes extending along the peduncle. Gonads upon the stomach and the lobes.

Hippocrene Macloviana (Lesson, 1829).

Umbrella bell-shaped, as high as broad or a little higher than broad, with a quadrangular margin; longitudinal furrows on the exumbrella.

Stomach small, cubical, situated on a broad inverted cone-shaped peduncle, and has four narrow perradial lobes extending along the whole length of the peduncle.

Mouth small, with four short perradial lips, about two thirds down the umbrella-cavity.

Oral tentacles four, perradial, closely and thickly branched,

each with about eighty to one hundred or more terminal branches, with clusters of nematocysts.

Gonads upon the stomach and the lobes of the stomach, hanging down in a folded band from the peduncle.

Compound basal bulbs four, perradial, V-shaped, about thirty-five to sixty-five tentacles in each bulb, arranged in a double row.

An ocellus at the base of every tentacle.

Size: up to 15 millim. in height and 15 millim. in width.

The collection contains about one hundred and seventy specimens of this species, showing a complete series of stages from the earliest up to the fully developed adult.

The previous descriptions are based upon intermediate stages.

Cladonemidæ.

ELEUTHERIA, Quatrefages (1842).

Cladonemidæ with four or more undivided radial canals and four or more tentacles which are divided into two branches, one terminating with a knob of nematocysts and the other with a sucker.

Gonads over the top of the stomach. Mouth simple. Exumbrella without nematocysts.

Eleutheria Vallentini, sp. n.

Umbrella circular, about twice as broad as high.

Stomach-tube conical and small.

Mouth without lips, a plain round margin.

Gonads occupying the whole of the upper part of the umbrella, above the stomach.

Tentacles twenty-four, divided into two branches, the upper branch with clusters of nematocysts, the lower with a terminal sucker.

An ocellus on the extreme margin of the umbrella opposite each tentacle.

Size: 3 millim. in width and 2 millim. in height.

The collection contains only a single specimen of this fine medusa, and it was found on a frond of *Macrocystis*, commonly called kelp.

Williadæ, Forbes (1848).

Anthomedusæ with four, six, or more radial canals, each having one or more lateral branches (except very early stages), all running to the margin of the umbrella. Mouth

with four or more lips or a folded margin without clusters of nematocysts. Gonads surrounding the stomach and extending along the lobes of the stomach. Tentacles simple, evenly distributed (not in groups) round the margin of the umbrella; one tentacle opposite the termination of every canal.

WILLIA, Forbes (1846).

Williadae with six or more radial canals, each having one or more lateral branches (youngest stage without branches), all running to the margin of the umbrella.

Willia mutabilis, sp. n.

Umbrella slightly conical in shape, with a broad round summit, about as broad as high; margin slightly inverted.

Stomach small, with six to eight lobes.

Mouth with a closely folded margin.

Six or eight main radial canals, each with three or more branches.

Gonads surrounding the stomach and the lobes of the stomach.

Tentacles twenty-four or more.

Size: up to 6 millim. in height and 6 millim. in width.

The collection contains thirty-three specimens, showing various stages in development. The specimens show so much variability that the normal characteristics of the species remain doubtful.

LEPTOMEDUSÆ.

Thaumantidæ.

LAODICE, L. Agassiz (1862).

Laodice pulchra, sp. n.

Umbrella flatly curved, nearly twice as broad as high.

Stomach very large, with four large perradial lobes extending nearly to the margin of the umbrella.

Mouth with four large lips.

Gonads extending from near the stomach to within a short distance of the ring-canal, forming a series of short folds along the lobes of the stomach.

Tentacles about fifty, without a basal spur.

Cirri absent.

Sensory clubs (cordyli) generally three or four between every two tentacles and each situated on a small bulb.

Ocellus usually present at the base of every bulb, with a tentacle or a sensory club.

Size: up to 25 millim. in width and 15 millim. in height.

The collection contains five specimens belonging to the intermediate and adult stages.

Eucopidæ.

OBELIA, Péron et Lesueur (1809).

Obelia multicia, sp. n.

Umbrella flat, disk-shaped.

Stomach small, with a quadrangular base.

Gonads globular or ellipsoid, about midway between the stomach and margin of the umbrella.

Tentacles about eighty to ninety, with a heart-shaped basal bulb.

Marginal sense-organs small, eight.

Size: up to 3 millim. in diameter.

The collection contains sixteen specimens.

Obelia diaphana, L. Agassiz (1852).

The collection contains only a single specimen.

This species occurs on the Atlantic coast of North America.

TIROPSIS, L. Agassiz (1859).

Eucopidæ with eight adradial marginal sense-organs (not closed vesicles), each having an external opening above the velum. Each sense-organ has two or more otoliths and an ocellus at its base. Numerous tentacles. No marginal cirri. A gonad on each of the four radial canals. Stomach not on a peduncle.

Tiaropsis Davisii, sp. n.

Umbrella conical, a little broader than high, with moderately thick walls.

Stomach short, cross-shaped when contracted.

Gonads occupying nearly the whole length of the four radial canals, not touching the stomach, not extending quite down to the margin of the umbrella, forming a thin, narrow, simple band.

Tentacles about eighty.

Sense organs eight, adradial, fairly large (probably containing several otoliths).

Size: up to 11 millim. in width and 8 millim. in height.

The collection contains only three specimens.

PHIALELLA, gen. nov.

Eucopidæ with eight adradial marginal sensory vesicles. Each with two or more otoliths and situated on the margin of the umbrella between two tentacles. Many tentacles. No marginal cirri. A gonad on each of the four radial canals. Stomach not on a peduncle.

Phialella falklandica, sp. n.

Umbrella semiglobular, little broader than high, with thick walls.

Stomach short and quadrangular.

Mouth with four lips and a fimbriated margin.

Gonads hanging down in wavy folds, occupying nearly the whole length of the four radial canals, not touching the stomach and not extending quite down to the margin of the umbrella.

Tentacles sixty to seventy, with large basal bulbs.

Sense-organs eight, adradial, with two or more otoliths.

Size: up to 17 millim. in width and 11 millim. in height.

The collection contains eight specimens, which show a series extending from an intermediate to the adult stage; but there are no very early stages.

Phialidium cymbaloideum (van Beneden), found in British seas, belongs to this new genus.

PHIALIDIUM, Leuckart (1856).

Eucopidæ with many marginal sensory vesicles. One or more between every two tentacles, each having a single otolith. Many tentacles. No marginal cirri. A gonad on each of the four radial canals. Stomach not on a peduncle.

Phialidium simplex, sp. n.

Umbrella watchglass-shaped, twice to three times broader than high.

Stomach short, with four perradial lobes.

Mouth with four large fimbriated lips.

Gonads extending over the outer half of radial canals and reaching nearly down to the ring-canal, slightly folded.

Tentacles sixty to eighty-five, and a few tentacular bulbs; the maximum number probably about one hundred.

Sense-organs one between every two tentacles, with a single otolith.

Size: up to 22 millim. in width and 10 millim. in height.

There are about sixty specimens in the collection, forming a good series from an early stage up to the adult.

TRACHOMEDUSÆ.

Petasiidæ.

AGLAUOPSIS, Fritz Müller (1855).

Petasiidæ without centripetal canals, with numerous enclosed marginal sense-organs. Numerous tentacles, which are evenly distributed round the margin of the umbrella, and not arranged in groups.

Aglauopsis Conanti, sp. n.

Umbrella bowl-shaped, with an inverted margin, a little broader than high.

Stomach somewhat cone-shaped, about half the length of the umbrella-cavity.

Mouth with four large perradial lips, having a folded margin.

Radial canals and ring-canal very broad.

Gonads occupying nearly the whole length of the radial canals, but separated by a short space from the stomach and also from the ring-canal; transversely divided into lobes.

Tentacles very numerous, about two hundred or more, closely packed in two or three alternating rows round the margin.

Sense-organs internal, adjoining the ring-canal, about fifty or more, each with a single otolith.

Size: up to 18 millim. in height and 20 millim. in width.

The collection contains about one hundred and fifty specimens, showing a fine series extending from the early stages up to the fully-grown adult.

This species is dedicated to the memory of F. S. Conant, of Johns Hopkins University, who died of yellow fever contracted whilst engaged on the study of the Cubomedusæ of Jamaica, 1897.

VALLENTINIA, gen. nov.

Petasiidæ with four simple radial canals, without blind centripetal canals between them. Sixteen or more enclosed marginal sense-organs. Four solid perradial tentacles with suckers and twenty-four or more hollow tentacles evenly distributed on the margin having bands of nematocysts.